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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/817,104

04/01/2004

Youval Nehmadi

6317P077

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04/30/2008

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EXAMINER

LEVIN, NAUM B

ART UNIT

PAPER NUMBER

2825

MAIL DATE

DELIVERY MODE

04/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/817,104	Applicant(s) NEHMADI ET AL.	
	Examiner NAUM B. LEVIN	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/17/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to application 10/817,104 filed on 04/01/2004.

Claims 1-48 are pending in the application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-48 are rejected under 35 U.S.C. 102(e) as being unpatentable by Kitamura et al. (US Publication No.: 20050146714).

3. As to claims 1 and 24 Kitamura discloses:

Claim 1 A method, comprising:

receiving design information (design data as reference pattern – paragraph 397 is received/generated in step 206, Fig.19 using reference pattern generation unit 11, Fig.16 and recipe database receives reference pattern based on the design data in step 206, Fig.19 - paragraphs 442-444) **representative of a portion of a layer of an object that comprises sub-micron measurement targets** (extraction of the reference pattern from the design data is performed by using a result of the Boolean operations on

polygons/edges in a layer to-be-inspected/ sub-micron measurement targets of the design data and polygons/edges in a layer related to the layer – paragraphs 54-55, 683 Fig.91);

processing the received design information to provide a large number of measurement targets/processing comprising selecting measurement targets associated with optical proximity correction (OPC) - claim 11 (OPC pattern comprising multiple edges – Figs.94A-94B is added to reference pattern to correct pattern/processing the received design information; the second edges are detected by using the reference pattern – paragraphs 751-754) ; **and**

associating target measurement parameters/FIG. 1 illustrates system 100 as well as a measurement tool 150 such as CD-SEM 3D of Applied Materials Inc. of Santa Clara Calif. The system includes an interface 110 that receives an EDA file that describes at least a part of one layer of and sends it to a database 120. Processor 130 accesses the stored information and process it to provide a large number of measurement targets. The processor 130 also associates target measurement parameters to each of large number of measurement targets - Applicant's specification, paragraph 24; FIG. 7 illustrates an exemplary table 200 that allows a user to select targets or select target parameters that assist in automatic selection of the targets – Applicant's specification, paragraph 26/ **to each of large number of measurement targets** (the operator inputs recipe retrieval parameters (a device name and a process name, and an inspection mode)/ target measurement parameters into the inspection unit 12 through the input device 4 (step S302) - paragraph 461; The inspection unit 12

retrieves the recipe database 22 using the recipe retrieval parameters as a key and takes out the recipe data (step S304). Then, in order to acquire the pattern image to-be-inspected, the inspection unit 12 sets the image acquisition parameters to the image generation device 7 and directs the image generation device 7 to perform wafer loading, alignment, and condition-setting for the irradiation system 310 (step S306) – paragraph 462; alignment is performed using computer aided design/CAD system – paragraph 463; computer 350 is used for associating – paragraph 342; 861; 863; 873-874; 920; the image generation device 7 is implemented as scanning electron microscope/SEM shown in Fig.1 – paragraphs 464-465; The CD-SEM automatically measures a line width of a line-shaped pattern in a specified position using a line profile – paragraphs 18; 851);

Claim 24 A system, comprising:

an interface (Figs.1, 16) **for receiving design information** (design data as reference pattern – paragraph 397 is received/generated in step 206, Fig.19 using reference pattern generation unit 11, Fig.16 and recipe database receives reference pattern based on the design data in step 206, Fig.19 - paragraphs 442-444)

representative of a portion of a layer of an object that comprises sub-micron measurement targets (extraction of the reference pattern from the design data is performed by using a result of the Boolean operations on polygons/edges in a layer to-be-inspected/ sub-micron measurement targets of the design data and polygons/edges in a layer related to the layer – paragraphs 54-55, 683 Fig.91);

a processor (Figs.1, 16) for processing the received design information to provide a large number of measurement targets/processing comprising selecting measurement targets associated with optical proximity correction (OPC) - claim 11 (OPC pattern comprising multiple edges – Figs.94A-94B is added to reference pattern to correct pattern/processing the received design information; the second edges are detected by using the reference pattern – paragraphs 751-754); and for associating (control computer 350 – paragraphs 342, 861, 863, 873-874, 920) target measurement parameters/FIG. 1 illustrates system 100 as well as a measurement tool 150 such as CD-SEM 3D of Applied Materials Inc. of Santa Clara Calif. The system includes an interface 110 that receives an EDA file that describes at least a part of one layer of and sends it to a database 120. Processor 130 accesses the stored information and process it to provide a large number of measurement targets. The processor 130 also associates target measurement parameters to each of large number of measurement targets - paragraph 24; FIG. 7 illustrates an exemplary table 200 that allows a user to select targets or select target parameters that assist in automatic selection of the targets – Applicant's specification, paragraph 26/ **to each of large number of measurement targets** (the operator inputs recipe retrieval parameters (a device name and a process name, and an inspection mode)/ target measurement parameters into the inspection unit 12 through the input device 4 (step S302) - paragraph 461; The inspection unit 12 retrieves the recipe database 22 using the recipe retrieval parameters as a key and takes out the recipe data (step S304). Then, in order to acquire the pattern image to-be-inspected, the inspection unit 12 sets the image acquisition parameters to the image

generation device 7 and directs the image generation device 7 to perform wafer loading, alignment, and condition-setting for the irradiation system 310 (step S306) – paragraph 462; alignment is performed using computer aided design/CAD system – paragraph 463; the image generation device 7 is implemented as scanning electron microscope/SEM shown in Fig.1 – paragraphs 464-465; The CD-SEM automatically measures a line width of a line-shaped pattern in a specified position using a line profile – paragraphs 18; 851).

4. As to claims 2-23 and 25-48 Kitamura recites:

Claims 2-3, 25-26 The method/system, wherein the measurement parameters comprise location information representative of a location of the measurement site (paragraphs 340-342, 522, 539, 578);

Claims 4, 27 The method/system, wherein the measurement parameters comprise a measurement field of view (paragraphs 392, 403, 447);

Claims 5, 28 The method/system, wherein the measurement parameters comprise an electron beam parameter (paragraphs 104, 313, 376);

Claims 6-7, 9, 29-30, 32 The method/system, wherein the step of associating target measurement parameters comprises determining a presence of a unique feature within a measurement site that comprises a measurement target (paragraphs 542-554, Fig.58);

Claims 8, 31 The method/system, wherein said processing comprises applying auto-correlation operation (paragraph 504);

Claims 10, 33 The method/system further comprising grouping measurements located within a field of view of a measurement tool (paragraphs 597, 818);

Claims 11, 34 The method/system, wherein the stage of processing comprising selecting measurement targets associated with optical proximity correction (paragraphs 751-754);

Claims 12, 14, 35, 37 The method/system further comprising measuring the large number of measurement targets to provide measurement results (paragraphs 18, 19, 604, 637);

Claims 13, 36 The method/system, wherein the stage of measuring comprises scanning measurement targets with an electron beam (paragraph 1056);

Claims 15-18, 20, 43-46, 48 The method/system further comprising processing the measurement results to provide an indication about the fabrication process (paragraphs 5, 51, 335, 395, 601);

Claims 19, 47 The method/system, wherein the processing comprises determining optimal design features (paragraph 522);

Claims 21, 38 The method/system, wherein the stage of measurement comprising a stage of locating a vicinity/space width of a measurement target (paragraphs 54, 187, 295-296, 499-500);

Claims 22-23, 39-40 The method/system, wherein the stage of providing a large number of measurement targets further comprises locating auto focus targets (paragraphs 235, 440, 966, 973, 976, 984).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAUM B. LEVIN whose telephone number is (571)272-1898. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Naum Levin/
Examiner
Art Unit 2825

Application/Control Number: 10/817,104
Art Unit: 2825

Page 9